

Description of the imago and larva of a new species of *CHRYSOPA*.

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Chrysopa Illinoiensis, n. sp.

Pale green, moderately pubescent; dorsal stripe broad, very light prasinous; sides verdigris-green, paler beneath. Head above, posteriorly greenish-yellow, anteriorly and beneath pale yellow; a small black line in front of the eye; between the base of the antennæ, the eye and the black line in front, a reddish-purple spot; mouth red. Eye in life, green with golden and other prismatic reflections, displaying in the sunlight a most beautiful play of changeable colors; eye in death, of a dark leaden hue. Antennæ white, basal article with a very faint shade of green. Maxillary and labial palpi white, with a longitudinal black line on the exterior side of each; upper segments pointed with fuliginous; a small black spot beneath the base of the maxillæ. On the side of the prothorax anteriorly, a reddish-fuscous line, equal to that in front of the eye, and apparently in a right line with it through the centre of the eye. Legs greenish-white; tibiæ and tarsi lightest, slightly clothed with a ferruginous pubescence, predominating on the tarsi and without close observation, appearing to give color to the tarsi; claws brownish. Wings hyaline, beautifully iridescent; nervures light greenish-white, with a deeper shade of greenish at the base and through the middle, clothed with short black hair, most numerous on the margins, alternating on the internal costa, each hair terminating in a fine point. Form slender. Wing almost twice the length of the body, apex somewhat rounded, the very slight acumination slightly predominating in the posterior pair. Antennæ long, articulations very numerous, basal article much swollen.

Measurements.

Length of body,33 to .45 inch.
Alar expanse,	1.025 to 1.08 "
Length of wing,5 to 5.3 "
Breadth of wing,18 to .2 "
Whole length to tip of closed wings,58 to .62 "
Antennæ,35 to .4 "

Hab.—Illinois.

The foregoing description was taken from a large suite of living specimens obtained from a field of corn, which had been sown very thick for fodder. The specimens were mostly taken either in the larva or pupa state, and matured. They were very numerous in the latter part

of September, so much so that I feel safe in saying that there was one or more for every stalk of that thickly sown corn; every stroke of the cutter would raise three or four dozen of them, presenting quite an interesting spectacle as they staggered along in their awkward, unsteady flight. In the evening twilight I observed more of them on the wing voluntarily, than at other times. In this corn were millions of chinch-bugs (*Lygæus leucopterus* Say), every stalk being literally black with them; this was a second general brood of the bugs; the first almost matured in an oat and wheat-field near by, and migrated to the corn, where they paired and laid their eggs. On these young chinch-bugs I observed the larvæ of the *Chrysopa* to be feeding very voraciously. Of all the perfect insects then and there examined, I only found one of a different species (similar to *Ch. pseudographa*, but the segments each side have a red instead of a yellowish spot, and a red spot on each side of the face), and I caught and examined hundreds in the field with a view of determining that fact; as this was an isolated specimen taken in the perfect state, it is quite probable that no other than the species heretofore described were preying on the chinch-bugs.

LARVA.—Greenish-white, immaculate beneath; above, on each side of the dorsal line, three rather inconspicuous longitudinal rows of brown spots, these spots much more prominent on the thoracic segments; dorsal line brown, narrow; bunches of short hair in the spots of the segments of the body. Body swollen in the middle, tapering towards each end; tail quite acuminate, and used as an organ of locomotion, it being able to sustain its entire weight by the tail, even on glass. Head armed with long projecting mandibles; palpi two-thirds as long as the mandibles; antennæ longer; length at rest, about .5 inch., extending considerably when in motion.

When alarmed by disturbance, it allows itself to fall, and remains motionless for some minutes; the body in the meantime is slightly curved, the tail is drawn under, the head is bowed forward on the breast, and the legs are contracted.

Sept. 11, 1864.—I placed one of the larvæ into a vial, after having captured it in the field in the very act of devouring chinch-bugs of all sizes, but they had hardly reached the bottom before it seized one of the largest ones, pierced it with its long mandibles, held it almost motionless for about a minute while it was sucking the juices from the body of its victim, it then threw down the lifeless shell; in this way I saw it destroy, in quick succession, about a dozen bugs; towards the last, as its appetite was becoming satiated, it spent five or more minutes

in sucking the juices from the body of one bug; after this bountiful repast, it remained motionless for an hour or more, as if asleep. Never, for a single moment, during the feast, did it pause in the work; when not in possession of a bug, it was on the search for, or in the pursuit of others; it manifested much eagerness in the pursuit of its prey, yet not with a lion-like boldness, for, on several occasions, I observed a manifest timorousness, a halting in the attack, as if conscious of danger in its hunting expeditions, although here there was none. Sometimes, when two or more bugs were approaching rapidly, it would shrink back from the attack, and turning aside, go in the pursuit of others. At length, awakening, it would renew the assault as before. On one occasion, when it was on the side of the vial, two inches up, with a large bug in its mouth, I jarred the vial so that it fell to the bottom, and rolled over and over across the bottom, but holding on to its prey, it regained its footing and mounted up to its former position. Occasionally the chinch-bugs would hasten to escape when pursued, as if in some degree conscious of danger.

Sept. 12th—Evening.—I observed the *Chrysopa* in an angle formed by some paper at the bottom of the vial, spinning a very attenuated web. It has just commenced the work, having thrown out some of the outer stays as a support for the intended cocoon; its body is curved in the form of a semicircle, its head drawn inward toward the breast; fixed in this position it is spinning with its very pliant tail, thrusting it out in all directions, bending it as freely and gracefully as the trunk of an elephant, but with great rapidity. This is certainly a very beautiful sight to behold, so frail a creature constructing with such unerring and mathematical precision, its temporary grave, and very naturally suggests the thought, has it any idea of its future resurrection in newness of life? Upon accidentally jarring the vial it remains motionless for the space of ten minutes or more, now, if possible, more cautious than ever before, still true to its former nature, depending upon playing the "possum" for safety. At length it commences very slowly and cautiously to continue spinning its web, and now apparently feeling safe from danger, it works rapidly as before, occasionally shifting half way around in the direction of its head by a quick jerk; in this way its very flexible tail has access to every part of its cocoon. During my entire observation of several hours, it holds its body in the same plane—the plane in which it was curved when I saw it commencing its work, and doubtless remained in this position within the cocoon.

Sept. 13th—Morning.—The outer visible work is completed; in the

centre of the thinly scattered outer fibres it has formed a closely-woven, subspherical cocoon, very smooth exteriorly, of a light gray color, about the size of a No. 1 shot, slightly prolate-spheroidal. This specimen had only four legs in the larva state, the anterior and middle legs of the dextral side were wanting, probably lost by accident. Greatest diameter of cocoon .16 inch., least .125 inch. These measures were taken from several pupæ gathered from the field.

Oct. 11th.—The imago has appeared with *all six legs* complete; those wanting in the larva are of full size and perfect with the others, making about one month in completing the transformation.

The subimago escapes from the cocoon by opening a lid at one end, and in all the specimens which I bred—about two dozen—I observed a very thin transparent pellicle near by, so light that it may be readily blown away by the slightest breath of air. The perfect insects, on an average, lived about ten days in confinement without food.

Nov. 29th, 30th and Dec. 1st.—I saw a number of this and other species of *Chrysopa* voluntarily flying, the weather being quite warm, so much so that the ground, which, during the severe cold weather of the past three weeks, was frozen to the depth of eight inches, has entirely thawed out, so that ploughs are running. It is probable that the perfect insects survived that cold weather, and if so, they may live during the winter, in which case the farmer has much to hope from this insect in suppressing the ravages of the chinch-bug, that of all insects the most injurious to the agriculturist in this region at the present time, and at all events we hope that many will pass the winter in the pupa state, as I have some in that condition in my breeding boxes, although most of them matured. Judging from what I observed during the past summer, we have good grounds to hope that ere long it may prove one of the most effective means of exterminating the chinch-bug, in connection with other insects that I observed to feed on them also at the same time. In some specimens the middle of the thorax and top of the head are much inclined to light yellow, in others cretaceous; in the very young imago the top of the head is light green, and the posterior part of the abdomen appears of a cloudy dark color from being semitransparent, showing partially the contents of the intestines. In some specimens I find the anterior lateral spot of the prothorax very faintly visible or entirely wanting, in others blackish; all of which in other respects coincide with the typical specimens, and probably are identical. I observe one or two among my dried specimens having a faint reddish spot on the side of the neck; if it is not this species, per-

haps it is *Ch. Harrisii*. Generally, in the dried specimens the face and dorsum are much more yellowish instead of light green, the anterior lateral prothoracic spots are not so conspicuous; antennæ very slightly darkened, especially towards the points, and the tarsi have become somewhat, but not very conspicuously, darker than the rest of the legs.

COMPARISONS.—This species almost agrees with *Chrysopa rufilabris* and *Harrisii*, but differs in having no black nervures or rufous occipital points, in having the antennæ uniformly white in life, and the nervures all fimbriated with black. Differs from *Ch. plorabunda* in not having a yellow dorsal stripe or yellow pointed antennæ in life, in having the anterior wings, as well as the posterior, a little acuminate, in the larger size and the brownish feet and ungues. It differs from *Ch. pseudographa* in having the dorsal line broad instead of narrow and white, in not having the segments each side with an apical yellow spot, &c.; and among all these similar species I see no account of a small black spot at the base of the maxillæ, hence I presume this to be a prominent specific mark.

While this species contains many characteristics distributed among Dr. Fitch's descriptions of *Ch. rufilabris*, *Harrisii*, *externa*, *Robertsonii*, *plorabunda*, *pseudographa* and others, yet it does not entirely agree with any one of them. Hence, if there was any just warrant for constructing so many species from insects so very similar, from such high authority as Dr. Fitch, and that, too, confirmed by Hagen, leaving out of the question the very important fact of this species feeding and multiplying so extensively on chinch-bugs, which, it may be argued, was only circumstantial from the presence of the bugs, I can see no just cause why this also should not be entitled to specific rank. This is the only apology I have to offer the scientific world for thus presuming to add another to the already numerous species of *Chrysopa*.

MOUNT CARROLL, ILLINOIS, January, 1865.